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John M. Caldwell
DOCTOR

AN
A T T E M P T
To establish the
ORIGINAL SAMENESS
OF
Three Phenomena of Fever,
(PRINCIPALLY CONFINED TO INFANTS AND CHILDREN),
Described by Medical Writers under the several
Names of
HYDROCEPHALUS INTERNUS, CYNAN-
CHE TRACHEALIS,
AND
DIARRHEA INFANTUM.

By CHARLES CALDWELL,
FELLOW OF THE COLLEGE OF PHYSICIANS OF PHILA-
DELPHIA, &c.

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PHILADELPHIA;

PRINTED BY THOMAS DOBSON, AT THE STONE-HOUSE,
N^o 41, SOUTH SECOND-STREET,

1796.

AN
INAUGURAL DISSERTATION,

FOR THE DEGREE OF

DOCTOR OF MEDICINE;

Examined and approved by

THE MEDICAL FACULTY

OF

The University of Pennsylvania,

AND DULY DEFENDED BEFORE

THE BOARD OF THAT INSTITUTION,

ON THE 17th DAY OF MAY 1796.

TO THE
PRESIDENT AND MEMBERS
OF THE
AMERICAN PHILOSOPHICAL SOCIETY.

GENTLEMEN,

I *FLY* not to the authority of the American Philosophical Society as a city of refuge from the strictures of criticism; nor do I supplicate from the dignity of the Philosophical character the shadow of patronage to the following publication. My open appeal is made, my respectful address is directed solely to that liberality and candor which never fail to characterize the truly philosophical mind.

I have ventured to explore a narrow, but in my view, an important tract of terra incognita in pathological science: I have hazarded a free and a public declaration of what I there observed. To most, if not indeed to all practitioners of medicine, my position respecting

pecting the original sameness of the three topical diseases embraced in my dissertation, will be wholly new ; to many it will appear improbable, perhaps erroneous. A thorough and dispassionate investigation of this subject is what I most earnestly desire. If my opinions be indeed unfounded, I am open to conviction on rational principles ; if they be just, I wish to see them more ably elucidated, more fully confirmed. In neither case can my views be answered ; in neither case can the interest of science be advanced, save by the talents and attention of medical philosophers alone—To the magnitude and difficulty of such a task, mere physicians are wholly incompetent.

To the medical philosophers, therefore, of the institution I address, is the following inaugural dissertation more particularly dedicated. To their liberality it is recommended ; to their perusal and consideration it is freely submitted. They will examine it with candor, and judge of it without the bias of prepossession. Their decision will be the voice of calm conviction, not the cry of impassioned prejudice. They will think, they will “ speak of it as it is.” Their award will be characterized

terized by literal justice, not by severity undeserved, not by indulgence unsolicited. They will not condemn from motives of envy, nor will they praise from those of special grace.

Should the principles and opinions contained in the following pages correspond to the enlightened views of such competent and impartial judges, their approbation will not only afford the highest gratification to my feelings, but will doubtless tend to my farther confirmation in the truth of those medical tenets I am about to deliver to the world. But should they, on the other hand, be considered as either doubtful or wholly unfounded, the strictures and objections of the liberal and learned, shall, from me, ever meet with a candid reception.

With sentiments of esteem and respect the most profound, I have the honour to be,

GENTLEMEN,

Your obedient and

Very humble servant,

PHILADELPHIA, }
May 4th, 1796. }

THE AUTHOR.

INTEGRAL CALCULUS

BY
J. W. L. GLAZIER, M.A.,
FELLOW OF THE UNIVERSITY OF CHICAGO

CHICAGO
THE UNIVERSITY OF CHICAGO PRESS
1914

THE UNIVERSITY OF CHICAGO PRESS
1215 EAST 59TH STREET
CHICAGO, ILL.
1914

PRINTED BY THE UNIVERSITY OF CHICAGO PRESS
1215 EAST 59TH STREET
CHICAGO, ILL.
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Inaugural Dissertation, &c.

SECTION I.

INTRODUCTION.

THE frequent occurrence, the obstinate resistance, and the melancholy effects of those *phenomena* of fever to which my present speculations are confined, will doubtless be admitted as a sufficient apology for every possible attempt to investigate their cause, to elucidate their nature, or to obviate with success their worst result.

I have called them *phenomena* or *symptoms*, because I do not consider them as primary diseases; I shall treat of them as the dependent *effects*, not as the original *cause* of that febrile state of the system, by which they never fail to be accompanied. Without the previous existence of general fever these phenomena can no more occur, than an effect

can, in any instance, take place without the pre-existence and pre-action of its cause. They shall be considered then, in the following pages, as the genuine and destructive offspring of *arterial action*, morbid in its *nature*, excessive in its *violence*, and by causes of peculiar tendency determined to the *encephalon*, the *trachea*, or the *intestines*.

I cannot believe, as is alledged by some, that these phenomena or symptoms of general disease, even when existing in the most consummate degree, possess any considerable power as co-operating causes tending to augment the febrile affection from which they derived their origin *—They are the immediate result of an evacuating process, which never fails to diminish the impetuosity and tumult of fe-

* To the extent of this general observation, *Cynanche trachealis* (that most distressing, and perhaps I might add, most fatal of all febrile phenomena) may seem indeed to constitute a just exception. Possibly the preternatural membrane, which here occurs, and invests, as a lining, the parietes of the trachea, may, by its irritating and painful impression on this exquisitely sensible tube, co-operate with other causes in continuing or even augmenting that febrile affection from which it originally derived its existence. Neither observation, however, nor yet any practicable effort of speculation has been able to furnish me with reasons sufficient to convince me, that that from this cause, so partial and circumscribed, any febrile affection of importance can probably arise.

brile

brile action. This process is, indeed, in the present case, uniformly attended with more or less uneasiness and pain; but the stimulant effect of the pain occasioned by the distension of the arteries and their consequent effort to discharge their irritating contents, is perhaps fully counterbalanced by the powerfully sedative tendency of the simultaneous evacuation.

But although these phenomena be indeed the effects and not the causes of that febrile affection of the system by which they are always accompanied; yet when completely formed, they become real and original causes of succeeding symptoms, more alarming in their appearance, more distressing in their nature, and more certainly fatal * in their final result.

* I would by no means have the reader to suppose, that I believe hydrocephalus internus, cynanche trachealis, and diarrhea infantum to be diseases literally incurable—It is however a consideration equally painful to *humanity*, and humiliating to the *professors* of the *healing art*, that when once these local affections have become fully established and firmly rooted in their respective organs, they too frequently baffle every possible attempt to dislodge them, and thus free the system from that melancholy groupe of symptoms to which they give birth and duration. Hence, therefore, we infer the necessity of treating the system, previously to the actual existence of these phenomena, in such a way, as may most effectually tend to prevent their complete accession.

Of these latter symptoms a brief detail shall be given in subsequent pages of this dissertation.

I have said that those phenomena of fever, to which my present speculations immediately relate, are principally confined to *infants* and *children*. I beg leave to state a few observations briefly explanatory of the cause, why this tender, helpless, and innocent portion of the human race, are so exclusively * subjected to such formidable and destructive maladies.

At the expiration of ten lunar months from the period of conception, the tender infant emerges into actual life, with many organs and parts of its body in a very unfinished and imperfect state. This imperfection manifests itself to a degree peculiarly obvious and striking in the bones of the head and face. Those of the head in particular exhibit nu-

* Exceptions may perhaps be taken to the pointed definitude of the word "exclusively." Many physicians of accuracy and eminence allege, that they have actually seen adults affected by the diseases now under consideration, more especially by that of hydrocephalus internus. I admit and believe that such cases do indeed occur; but they are so extremely rare, as to merit no particular attention in an essay chiefly confined to general observations and principles, and not intended to treat of subjects in minute detail.

merous phenomena of a state extremely immature. They are unfinished with respect to texture and firmness (possessing a *cartilaginous* rather than a *bone-like* consistence) and so highly defective in point of size, that considerable interosseal vacuities are known to exist in this important part of the infantile system.—As nature seems to delight in a certain degree of perfection in all her works, such is the purport, such the uniform tendency of her established laws, that these deficiencies in the bones of the cranium must be gradually supplied—Not to mention the changes which are yet to be effected in the *consistence*, the *articulation*, and the *figures* of the upper and lower maxillary bones, these are both, in subservience to the fundamental and governing principles of the system, to be furnished with two several sets of teeth. Besides those already specified, there exist, in the head and adjacent parts of the infant, various other deficiencies, in degree less obvious, in nature less important.

For certain essential and wise purposes in the important economy of man, it is necessary that the organization of the head be brought to ultimate perfection at an early period of life. The existing deficiencies are therefore supplied, and most of the requisite changes in this part of the system are usually effected about the child's arrival at its twelfth year.

During the whole of this interesting period of human life, as well as for several years afterwards, the head exhibits a size evidently disproportioned to that of the other parts of the body. To accommodate the disproportioned size of this part of the system, and also to furnish matter for supplying the deficiencies and effecting the requisite changes of which I have already spoken, there necessarily exists, during the years of infancy and childhood, a disproportioned determination of blood to the head and immediately adjacent parts.

That such determination to the head does indeed exist, more especially in the infantile state, we may farther infer from the constant and profuse discharges of saliva and mucus, which, during this state, very generally take place from the eyes, nose, and mouth ; as also from the troublesome and painful eruptions which so frequently appear on the heads of children during the two or three first years of life.—Similar discharges of mucus not unfrequently occur in adults, when in consequence of an obstruction of perspiration, co-operating with a constipation of the bowels, and a diminished secretion of urine, an undue proportion of blood is forcibly thrown into the vessels of the head.

During

During such a disproportioned afflux of blood to the head of infants and children, it is obvious that this part of the system must, from any considerable encrease of arterial action, be subjected to more or less danger in consequence of the augmented impetus of the circulating fluid against the very delicate vessels of the encephalon. When in these young and tender subjects a violent attack of fever occurs, with dry skin, costiveness, and a parsimonious discharge of urine, so much is the determination of blood to the head generally augmented, as to subject the unhappy patients to the hazard of all the disastrous consequences of effusion, either from ruptures, or from an undue and morbid action, of the tender vessels of the part—Hence we deduce the *leading cause* why hydrocephalus internus, which consists of a preternatural effusion of a serous or of an aqueous fluid into the ventricles of the brain, is so very generally confined to infants and children.

We may further observe, that such subjects are much more frequently than adults exposed to injuries of the head from blows, falls *, and other accidents arising out of the nature of their early sports

* When children fall (an incident which often occurs) the *head*, in consequence of its disproportioned size and weight, seldom fails to become a suffering part.

and amusements. These injuries often operate as exciting causes of morbid and excessive action in the vessels of the encephalon, thus exposing that important viscus to the risk of all the dreadful consequences attendant on inflammation * or effusion. To the foregoing considerations perhaps we may with sufficient propriety add, that of human subjects during the earlier periods of life, being more uniformly confined to a recumbent or horizontal position, than is the case with those whose years are more numerous, and whose consequent acquisitions of strength are more considerable. To physicians at all acquainted with the striking effects of gravitation on the circulation of the blood, it is wholly unnecessary to observe, that a recumbent position of the body is highly favourable to a forcible propulsion of blood into the tender vessels of the encephalon. The probable consequences which, during a general febrile affection, may result from such habi-

* It must here be observed, that infants and children are much less subject than adults to severe attacks of *true topical inflammation* originating from general fever. The cause of this should be sought for in the laxity and extreme irritability of the exhaling vessels in the former subjects, and the consequent facility with which they give admission to copious topical effusions. This observation will apply to the vessels, not only of the head, but also to those of every other part of the system during the earlier years of life.

tual propulſion, are too obvious to call for a particular ſpecification.

I have thus enumerated ſome of the principal cauſes which ſeem to co-operate moſt powerfully in ſubjecting infants and children, rather than adults, to that melancholy affection of the head denominated *hydrocephalus internus*. I will conclude my introductory ſection by attempting a few obſervations explanatory of the reaſon, why the two remaining diſeaſes, namely, cynanche trachealis and diarrhea infantum, are ſo excluſively confined to ſubjects of the ſame age.

That in *infants* and *children* the general volume of fluids bears a much greater proportion to the aggregate maſs of ſolids than in *adults*, is a truth with which anatomiſts and phyſiologiſts have been long acquainted. That in the former ſubjects the action of the arterial ſyſtem is proportionally more vigorous, and the motion of the blood conſequently more rapid than in the latter, is alſo a poſition that will not be controverted by the medical philoſopher. From theſe two well known circumſtances, taken in conjunction with the great laxity and exquisite irritability of the minute arterial extremities, much more copious diſcharges take place from exhaling and ſecreting ſurfaces in very early than in more advanced

advanced periods of life. Thus in infants and children we observe numerous and plentiful stools of a soft consistence, often profusely abounding with the *mucus* of the intestines; while at the same time frequent discharges of a viscid phlegm by coughing and vomiting give evidence of a copious secretion going forward in the esophagus, the trachea and its ramifications, the bronchiæ.

Nature, as if conscious of these peculiarities in the infantile economy, not unfrequently attempts to avail herself of them for the purpose of eliminating from the arterial system superabundant portions of fluid, which if retained, might by its stimulant impression prove injurious to health, perhaps even destructive of life itself. Thus, for example, when children are attacked by a fever of excessive action *, in which case a diminution of the volume of

* I beg leave in this place to suggest the propriety of distinguishing between genuine *inflammatory fevers*, and simple fevers of excessive action. It is indeed true, that inflammatory fevers are always fevers of too much action; but of this proposition the converse is by no means equally admissible. Fevers of too much action do not necessarily possess a nature truly inflammatory. In order to be, with literal propriety, entitled to the denomination of inflammatory, a fever should be always accompanied by a topical affection, where the evanescent extremities of the arteries are themselves brought into
blood

blood becomes necessary, an effort of the constitution most undoubtedly takes place to effect this salutary purpose by an increased discharge from some

excessive action, and where pain is thus generated by over-distension from fluids in a misplaced situation. In a simple fever of excessive action, no such local affection, no such striking inequality of arterial exertion appears—In all parts of the system the larger arteries act with too much frequency and too much force ; but in no part do the minute ramifications play with such undue violence as to produce either an *error loci*, or a preternatural effusion of the circulating fluids. That such a simple state of fever may, and indeed does, in some cases, unequivocally exist, we are induced to believe both from speculative theory and actual observation.—

Thus, for example, should a fever consisting in excessive arterial action occur in a human subject where every organ and part of the system are in perfect equilibrium with regard to irritability, sensibility, power, and action ; in such a case the production of a topical affection would be wholly impracticable. That systems of such an exquisite balance may actually exist, is a position to the probability of which we can be easily induced to give our assent ; and that fevers of such simplicity do indeed occur, is a truth which I trust will not be denied by physicians of experience and real observation. Between fevers truly inflammatory and those simply of excessive action, a very material difference should be observed in point of practice—In the former both general depletion and topical applications are absolutely essential ; whereas in the latter general depletion is alone sufficient.

particular

particular part of the system—or, in other words, an undue determination of blood to some organ or part of the human body generally occurs. When this determination is directed to the trachea, cynanche trachealis is too often the melancholy result—when to the intestinal and hepatic systems, the patient is subjected to an attack of diarrhea infantum.

Perhaps the continued irritation produced by the tedious process of teething, may co-operate as an assistant cause in pointing the morbid determination to the trachea of children; while, on the other

With regard to the *three diseases* which constitute the object of my present dissertation, they would be all of a truly inflammatory description, were they not forced to assume a different character by certain peculiarities in the systems and constitutions of those subjects where they generally appear. Thus, what in infants and children becomes hydrocephalus internus, would in adults assume the form of genuine *phrenitis*, and run on perhaps to actual suppuration; cynanche trachealis would show itself in *peripneumony* or *angina inflammatoria*; and diarrhea infantum would be converted into *enteritis*, or into an inflammatory affection of the liver.

These propositions will be perfectly intelligible, and will, I am sure, appear sufficiently probable and satisfactory to those, who have paid due attention to the numerous and diversified modifications of disease, resulting from differences of age, habit, and constitution.

hand,

hand, certain species of food with which these tender subjects are occasionally supplied, may tend to increase the debility and consequent irritability of the intestines, and thus aid in predisposing to an undue determination to that part of the system.

Having thus introduced my subject by a few preliminary observations of a general nature, I will next proceed to deliver, in brief detail, the most striking and characteristic specialties of the three diseases now under consideration—I will attempt to give a succinct statement of the most usual precursors of each disease, to point out the first phenomena that should occasion serious alarm, to trace the future changes that commonly succeed, and to specify such symptoms as most unequivocally announce the approach of death. After having, in three several sections, affected in some measure the accomplishment of these different objects, I will in my next, attempt the establishment of a parallel between the three topical diseases, or rather symptoms of general disease, which constitute the leading objects of my enquiry: In other words, I will endeavour to shew, on the solid and rational ground of *facts* and *direct induction*, that the topical affections of hydrocephalus internus, cynanche trachealis, and diarrhea infantum, are in nature very closely allied to each other, being indeed nothing else than
noxious

noxious and exuberant branches from the same parent stock *. In a subsequent and concluding section I will lay down a few general rules relative to the cure, or rather prevention of these melancholy affections.

SECT. II.

OF HYDROCEPHALUS INTERNUS. †

THIS dreadful phenomenon of fever is, as already observed, with a few exceptions, peculiar to infants and children from the early age of six months to the tenth or twelfth year of life. Neither situation, climate, nor condition in life can afford secu-

* If the reader would allow me to indulge my fancy in a comparison equally simple and descriptive, I might say, that these three infantile diseases, taken in conjunction with the fever from which they originally spring, resemble a sprig of our common *trifolium pratense*, where three kindred leaves are protruded from, and supported by, one general connecting or common footstalk.

† Although not immediately connected with the subject of my present investigation, I am yet unwilling to neglect so favourable an opportunity of stating a few structural observability

rity from its remorseless attack. It acknowledges no distinctions, either in point of rank, wealth, or merit; but visits alike the families of the high and

tions on an opinion very generally entertained by practitioners of medicine, relative to a certain phenomenon attendant on *anasarcous swellings*.

It is a circumstance well known, that, during the hours of repose, while the body is suffered to rest in a posture nearly horizontal, such swellings are commonly determined to the face and parts immediately adjacent; whereas throughout the course of the day, when the body is preserved in a position more nearly perpendicular, they are removed again from the superior parts of the system, and uniformly thrown on the lower extremities, particularly on the ankles and feet. This *metastasis* or *translation* of swelling, is, by physicians, very generally supposed to be produced entirely through the medium of the *cellular membrane*.

Between all the different cells of this membrane so uniformly diffused throughout the several parts of the body, there appear indeed to exist communications more or less open and direct. By the immediate route of these communications the serous fluid, giving rise to anasarca swellings, is supposed to pass from one part of the body to another, without at all re-entering either the absorbent or sanguiferous system.

Thus, for example, physicians alledge, that that particular portion of serous fluid, which, in the morning is lodged in, and gives distension to, the cellular membrane of the face,
the

the low, the rich and the poor, the virtuous and the ignoble. It occurs at every season of the year, during the existence of a humid and chilling atmo-

begins its downward course as soon as the body is placed in an erect position; and, that influenced solely by the principle of gravitation, it passes slowly onward from cell to cell, till finally, towards the close of day, it arrives at its journey's end, and takes up a temporary residence in the cellular membrane of the lower extremities. Such physicians farther allege, that during the hours of the night, while the body is suffered to rest in a recumbent posture, this same portion of extravasated serum begins again to move in a retrograde direction, and, thus, uniformly governed by the same principle of gravitation, continues to pursue its journey towards the head, till it finally arrives at, and takes actual possession of, its former situation in the cellular membrane of the face and parts adjacent. Thus, is the same individual portion of serous fluid supposed to distend alternately the *cellular membrane* of the face and feet; and thus, is this *inexplicable web* considered as constituting a medium of easy and simple communication between the two extremes of the system.

To me it has, indeed, been ever disagreeable and painful, publicly to avow my dissent from medical opinions, sanctioned by the authority of the most celebrated patrons of physic, and rendered even holy, in the eye of most physicians, by the circumstance of their high antiquity. My feelings on this subject have been still more sensibly affected by the consideration, that the opinions, to the propriety and truth of which I have been, at any time, obliged to object, were particularly inculcated on my mind by those characters, to whom I stand

isphere; but exhibits itself most frequently about the close of autumn, throughout the whole of the winter, and more especially during the variable tem-

indebted for the first rudiments of my medical knowledge. Though early prepossessed by such powerful motives as these in favour of the *pathological doctrine*, just laid down, respecting anasarcaous translations, I am, notwithstanding, obliged to declare, that *such doctrine* is wholly repugnant to the opinion which I now entertain relative to this curious and interesting point of physics. I believe that the metastasis or removal of anasarcaous swellings from the face to the feet, and from the feet to the face, is effected, not through the medium of the *cellular*, but wholly through that of the *vascular system*. That such translation is not—that, in common cases, such translation cannot, be accomplished by means of an extravasated fluid journeying slowly from cell to cell, as already described, I would attempt to infer from the following series of considerations.

I. During the earlier stages of anasarca the cellular membrane, in most parts of the body, is as yet in a state considerably sound and healthy. Its tone is as yet unbroken; its cells and their communications are as yet undilated by means of frequent over-distension. While in such condition, therefore, this intricate and curious membrane can scarcely be conceived capable of affording so free and easy a transition to a small quantity of serous fluid, as to suffer it to pass, in eight or ten hours, from the one extreme of the body to the other, urged onward only by the power of its *own gravitation*. After the cells and their numerous communications have become greatly dilated and much relaxed by means of morbid and long con-

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perature

perature of the vernal months. Children of sound health, robust constitutions, full habits, and active minds, are most subject to be attacked by this ter-

tinued distension, such a transition may be considered as an event much more likely to occur.

II. Were it indeed true, that this fluid travels from the head to the feet through the mazy route of the cellular membrane, its progress would doubtless be marked by the following phenomena—The subsidence of the face would be succeeded by a gradual but obvious tumefaction of the neck, in consequence of the fluid having descended from the cells of the *former*, into those of the *latter* part of the body. Next would appear some degree of distension in the cellular membrane lying over the thorax; at length the intumescence would descend to the integuments of the abdomen, and thus might the fluid be traced through every step of its downward progress by an obvious distension existing in the place of its immediate lodgement. But to physicians, who have paid attention to this subject, it is wholly needless to declare, that no such phenomena as these are ever presented to our observation.

III. Were the cellular membrane the medium of conveyance for the distending fluid, from the face to the lower extremities, the following effects would doubtless result from tying a bandage immediately above the knee with such tightness as effectually to compress the subjacent stratum of cellular membrane, without obstructing at the same time the movement of the blood along the deeper seated veins—The vicarious swelling of the foot and leg below the ligature would
 rible

rible disorder—Those, in particular, of the above description, who are at the same time inclined to habitual costiveness, seem designated by nature as its

be entirely prevented, while, at the same time, an intumescence would form above the ligature, extending along the thigh to a distance in some measure proportionate to the previous swelling of the face. To such phenomena, however, I am authorised to say, that such an experiment does not give origin.

IV. Were the cellular membrane the only medium of the ferous fluid's descent, the intumescence of the face could not possibly subside without giving rise to a certain degree of intumescence in some other part of the body. This, however, is by no means the case; for by preserving the trunk of the body erect, and keeping the feet and legs at the same time in a horizontal position, and moderately compressed by means of general and equable bandages, we well know that the swelling of the face will often subside throughout the course of the day, while no fulness or distension will appear in the cellular membrane of any other part of the body.

V. That it is not the cellular membrane which affords a passage for the distending fluid from the face to the feet, may be farther inferred from the following consideration. If the patient sits throughout the day with his knees bent in such a way as to be elevated above his nates nearly the whole length of his thighs, at the same time that his feet and legs are suffered to rest in a position nearly perpendicular, these latter parts will be distended *almost*, if not *wholly* as much as if they had been kept in a right lined direction with the thighs, and

readiest and peculiar prey. Children whose heads are unusually large appear also to inherit the melancholy *birth-right* of a strong predisposition to hy-

had both been suffered to remain in an inclined position. Here it cannot possibly be supposed that the distending fluid has slowly forced its way through the whole length of the cellular membrane, urged on by the principle of gravitation alone : because in a certain, and even a considerable part of its journey, namely, in passing from the *nates*, or from the *groins* to the knees, it would be necessarily obliged to move in an upward direction—a direction very different indeed from that in any case effected by the operation of the gravitating principle. As, therefore, no cause can possibly produce an effect in direct opposition to its own immediate principle of action, the power of gravitation cannot be supposed to give rise to such a phenomenon, as the ascent of a portion of extravasated ferous fluid along the cellular membrane of the thigh.

VI. Having thus established in some measure, at least, the improbability of an extravasated fluid passing by the principle of gravity from the face to the lower extremities, through the medium of the cellular membrane, while the body is in a position more or less erect ; let us now for a moment attend to the reverse of this pathological proposition. Let us examine what testimony exists in favour of a belief, that during the hours of night, while the body is laid in a posture more nearly horizontal, a fluid can pass, through the medium of the cellular membrane, from the feet and legs to the face and parts immediately adjacent ? Here we shall find that this fluid, in its passage from the feet to the head, must necessarily meet with

drocephalus

drocephalus internus. Such as are subject to troublesome eruptions of the head are extremely liable to be attacked by this disease if such eruptions too suddenly disappear.

difficulties greater—much greater, indeed, than those already pointed out as obstructing its passage in a contrary direction. The principle of gravitation is confessedly the only power, by the operation of which this extravasated fluid is supposed by physicians to move, while the body is suffered to remain in a state of entire rest. But the influence of this principle is certainly in full opposition to the motion of any fluid from the feet towards the head, while the body is reclined in a bed of the common form and direction. I need not here observe that a bed is always made in such a manner, as to have that end denominated its head somewhat elevated above its foot; consequently such must be the posture and direction of the body it contains; the feet must necessarily be depressed below the head. How then can we conceive it possible, that in a body laid in this inclined position, a quantity of extravasated fluid can, by the principle of gravitation be carried upward from the lower extremities, and finally lodged in the cellular membrane of the face?—Before such a result can possibly, in such a situation, take place, one of the *essential properties* of matter, together with all its dependent phenomena, must be either annihilated or completely reversed.

Were I now asked, in what manner this reciprocal alternation of swelling between the feet and the face is effected? I would answer, that it is accomplished entirely, not through the medium of the cellular membrane, but through that of the sanguiferous and lymphatic systems;—not by the agency of

This disease is, not unfrequently, excited by an early and imprudent use of opiates in attacks of diarrhea accompanied with fever, and also by the the principle of gravitation, but by the common laws of *circulation, exhalation, and absorption.*

Thus, for example, during the erect position of the body throughout the course of the day, the quantity of fluid exhaled or effused, from the evanescent arterial extremities, into the cellular membrane of the face of an anasarctous patient, is considerably less than that absorbed from the same part, by the incipient radicles of the lymphatic system. In consequence therefore of this disproportion between effusion and absorption, the whole of the distending fluid will be at length removed, first into the *absorbent*, and thence into the *sanguiferous* system, and an entire subsidence of the face will be thus effected. On the other hand, the feet and legs are, during this time, in a depending position. From this circumstance an undue accumulation of blood occurs in the lower extremities, and in this part of the system throws the balance between effusion and absorption into the opposite scale, giving thus a decided preponderance to the former process. Of this superabundant effusion, a morbid distension of the cellular membrane of the ankles and feet, is the necessary consequence. When the body is again laid in a recumbent posture, this accumulation of blood in the lower extremities is removed, and the process of *absorption* gains once more, in this part of the system, an ascendancy over that of *effusion*. The distending fluid is therefore again removed from the cellular membrane of the lower extremities, and conveyed through the absorbent into the sanguiferous system.

operation

operation of all such causes as check or diminish the cutaneous discharge. In the former of these cases, that portion of stimulating fluid which would have been eliminated by the bowels, in the latter that destined to be evacuated by the skin, are determined to the encephalon with so much violence of febrile action, as to give origin to *congestion in*, and subsequent *effusion from*, the tender and irritable vessels of that important viscus.

* Hydrocephalus internus is generally ushered in by the following gloomy train of precursors. The

But while the evil is slowly declining in one, it is gradually increasing in another part of the debilitated body; for a recumbent position is highly favourable to a forcible protrusion of blood into the vessels of the head and face. In consequence of such protrusion, and its concomitant accumulation, the *effusive* becomes immediately superior to the *absorbing* process in this part of the system, and thus again an undue and morbid distension of the cellular membrane of the face is generated.

On such simple and well known principles as these, would I attempt to account for the alternation of anasarcaous swellings, between the face and lower extremities.

* If I have been less circumstantially minute in my description of hydrocephalus internus than Doctors Fothergill, Quin, and Rush, the reader will readily excuse me for this deficiency, when possessed of the motives by which I am wholly governed. My view is to give, unmixed, the genuine result

child becomes uncommonly dull and loses all relish for playful amusements. Its movements are languid, its gait slow, and its whole deportment more than usually grave.—To the native vivacity and lustre of its eyes, a dull lifeless appearance, accompanied by somewhat of a drowsy heaviness, succeeds, and its whole countenance bespeaks a degree of uneasiness and distress. Its disposition to cheerfulness and good humour forsakes it, and it becomes peevish, fretful, and sometimes sullen : even at this early period of indisposition the undue determination of blood to the head is often unequivocally pointed out, by small but repeated hemorrhages from the nostrils ; the temporal arteries are also more than usually turgid ; the eyes are watry and sometimes slightly pencilled with blood.

of my own experience, observation, and reflection. I rely as my authority on no one *dead*—I apply for my information to no one *living*—On the credit of my own observation I deliver my facts, on the authority of my own speculations I risque my opinions. As the experience of the authors referred to, must have been much more extensive than mine, this disease has doubtless presented itself to their observation characterized by a proportionally greater diversity and irregularity of symptoms. What I have myself seen, that have I given in brief detail ; what I have only read or heard (though impressed with an entire belief of the truth of each particular) I have not thought proper to embrace in my dissertation.

The

The appetite begins to fail, frequent but transient fits of nausea appear, and extreme *costiveness* takes place; or, if before habitual, becomes now much more obstinate and troublesome; broken and uneasy sleep, excessive and morbid wakefulness, but sometimes a propensity to sleep of a profound and comatose nature, exhibit themselves among the precursors of hydrocephalus internus. During the earlier stages of these several symptoms the patient seldom or never complains, nor even acknowledges the existence of actual indisposition. When interrogated respecting his health he either makes no reply at all, or answers in a careless and evasive manner.

At length, however, this insidious disease throws aside its mask, assumes a more open and daring deportment, and ventures to appear in all its native horrors. The system is invaded by a group of symptoms equally distressing in their nature, alarming in their appearance, and dangerous in their effects. The patient is arrested by a general and violent fever; the head becomes a seat of excruciating pain, and great prostration of all the voluntary powers succeeds. The pain of the head is sometimes uniformly permanent; but is more generally marked by temporary intermissions alternating again with returns the most acute and distressing. So great is the accumulation of sensibility in certain parts

parts of the system, at this stage of the disease, that the impressions of light, sound, and motion prove often insupportable. In a case of hydrocephalus internus lately under my direction, so exquisite was the sensibility of the optic nerves as to demand a total exclusion of light ; so painfully sensible were the organs of hearing as to oblige me, when in the sick-room, to speak in the softest whisper ; and so distressingly acute was the affection of the head, as to extort from the patient reiterated screams of agony, and to prohibit me from walking the floor of the chamber otherwise than with the most slow and cautious step. This stage of the disease, especially in children of riper years, is oftentimes accompanied with symptoms of high and fierce delirium, such as wild, ferocious looks, quick, desultory, incoherent talking, occasional singing, or sudden paroxysms of terror *unexcited*, or of anger *unprovoked*, by any existing cause. During the whole of this distressing and dangerous period, the constipation of the bowels remains obstinate, and the stomach is strongly disposed to reject, immediately, every thing, whether liquid or solid, that is taken in by the mouth.

After the fever has continued, with slight morning remissions and strong evening exacerbations, from one to three or sometimes five days, a peculiar and striking affection of the eyes becomes observable.

ble *. The pupils, which were before contracted to a diameter unusually narrow, suffer a dilatation much greater than ordinary : their sensibility to light (already said to have been, in an earlier stage of the disease, preternaturally acute) begins now to suffer a slow, but progressive diminution, so as to sink, at

* I am indeed sorry at being obliged to deny my assent to the accuracy of that part of the treatise on hydrocephalus internus published by the learned and ingenious Dr. Quin, where the author points to the particular stage of disease in which he alleges the strabismus and dilatation of the pupils occur. The doctor evidently classes these affections of the eyes among the first groupe of symptoms that appear, thus making them nothing else than simple precursors or harbingers of actual disease. On this subject I must confess that my observations have furnished me with a very different result. If my memory be not extremely fallacious, and if I have not been unpardonably inaccurate and erroneous in notes which I have, at different times, taken down in sick-rooms to which I have been called, strabismus and dilatation of the pupils are affections of the eyes which seldom, if ever, take place till after the existence of very considerable fever : I would therefore class them among the *second*, perhaps I may say among the *third* groupe of symptoms characteristic of *hydrocephalus internus*. These are phenomena which do not barely portend an *approaching*, but strongly bespeak a high degree of actually *existing*, disease. They ought not to be viewed as the precursors, but as the melancholy consequences of fever ; being the immediate result of *effusion* or *congestion* in the volume of the encephalon, produced by the impulsive violence of febrile action.

length,

length, far below its common and healthy state ; while, at the same time, there supervenes a continued rolling of these globes in their orbits, together with a strabismus or permanent perversion of the direction of their axes. These affections are sometimes confined to *one*, but more generally extend to *both* of the visual organs.

In proportion to the advancement of this last groupe of symptoms, the *pulse* itself has been undergoing a gradual but very perceptible change. From having been considerably full, strong, tense and frequent, it has now become rather weak, soft, slow, and generally irregular, oftentimes intermittent. The intensity of the pain in the head ceases, and the less acute sensations of fulness and heaviness succeed ; the disposition to vomit disappears ; a constant tendency to coma takes place, while the patient when roused from his death-like slumbers swallows down drink, and often devours food, if offered, with an appetite of the utmost voracity : The eyes begin at length to suffer a very visible protrusion *from*, or rather an elevation *in*, their orbits ; and in the heads of infants a tumor more or less prominent is formed at the site of the fontanel. These two latter symptoms evidently result from the mechanical effect of a quantity of fluid effused and lodged in the ventricles of the brain.

This

This latter groupe of symptoms continues to increase in degree, while the strength of the patient hourly fails. As the pulse declines in *force*, it rises in *frequency* of action, till it may be said at length to flutter rather than pulsate. The growing insensibility of the system to impressions of every kind becomes gradually more and more confirmed; frightful distortions of countenance supervene; sudden twitchings or involuntary contractions of the muscles become frequent, and general convulsions at length coming on, put a period at once to wretchedness and to life.

SECT. III.

OF CYNANCHE TRACHEALIS.

THIS *topical* disease is uniformly accompanied by general fever in a higher or lower degree. When completely formed, it consists of a preternatural membrane* considerably tenacious and firm,

* Some writers speak of a stridulous suffocation originating from a simple spasm of the muscles of the larynx, or from a spasmodic affection of the trachea itself. As such a disease, however, has never fallen under my observation, and especially

investing the whole or part of the trachea, together, frequently, with part of its bronchial ramifications. This membrane may be said with propriety to possess a nature *sui generis*. It is different from common mucus; different from coagulable lymph; and different, indeed, in some measure, from all animal substances which I have seen subjected to the test of experiment.

Cynanche trachealis is principally confined to infants and children of a description similar to that already given of those particularly subjected to attacks of hydrocephalus internus. Like the latter disease it occurs at all seasons of the year, but appears most frequently about the close of autumn, throughout the months of winter, and during the variable temperature of the spring. No climate nor situation is wholly exempt from the ravages of this distressing and dangerous malady; but it appears to be, in some measure, *endemic* in places uniformly subjected to a moist and chilling atmosphere. Hence its frequency in the immediate vicinity of lakes, rivers, marshes, arms of the sea, and other extensive bodies of water.

as its very existence is with me a position somewhat problematical, it will engage no part of my attention throughout the present dissertation.

The

The preternatural membrane which constitutes this truly formidable disease, I consider as a product of febrile action, particularly determined to the *aspera arteria*. Whether this membrane be produced by the immediate action of the mucus follicles of the part, or by minute arterial extremities which, during health, exhale a more attenuated fluid, is a controversial point on which I do not mean to hazard an opinion.

This disease makes sometimes a very sudden and violent attack, but for the most part invades the system in a slow, gradual, and insidious manner. Its earliest precursors are nearly the same with those of hydrocephalus internus. They are such as unequivocally bespeak a general febrile affection of the system. The topical affection of the trachea is by no means among the earliest symptoms that appear. In all those cases where I have had an opportunity of making minute and accurate observations, slight symptoms of febrile indisposition existed at least for several hours, in most of them several days, before the peculiar hoarseness became at all perceptible. The reason why this affection of the trachea has been so generally considered as the earliest symptom, and therefore the original cause of all the subsequent train of evils, must doubtless be sought for in the inattention and inaccuracy of parents, nurses, and

and physicians, relative to the flighter phenomena of disease. In the present, as in most other instances of general fever, costiveness seldom fails to appear among the earlier precursors.

These moderate symptoms of general fever having continued for a *period* of time, subject, in different cases, to great variety with respect to its duration, a cough and hoarseness, accompanied by more or less difficulty of respiration, at length occur, which may be considered as the sure harbingers of approaching danger *. The cough attending cynanche

* A few cases of this disease I have seen accompanied by a temporary efflorescence or scarlet-like eruption on different parts of the body, which, during its continuance, seemed to afford a certain degree of alleviation to the symptoms of general fever.

I would here beg leave to observe, that the principles and laws of the *translation of real febrile action* from one part, or perhaps I may say, from one system of the body to another, would indeed form a subject of investigation equally curious, interesting, and important. Thus, for example, in small-pox and measles the cuticular eruption is nothing else than a genuine translation of fever from the arterial system to the skin; that is, from a deeper seated to a more superficial part; hence the evident abatement of the symptoms of general fever on the complete occurrence of a general eruption. Thus again the cutaneous eruption in what is called the *rash fever* appears

trachealis is accompanied by a very shrill and peculiar sound, which has been said by different authors to resemble the voices of several different animals. For my own part I do not think I have in any instance heard this morbid sound more nearly imitated, than by a harsh, disagreeable note, sometimes emitted by our common fowls in attempting to discharge from their throats a grain of corn, or some other obstructing body of considerable magnitude.

Soon after the symptoms of cough and hoarseness have become evident, the disease begins to assume a much more alarming and formidable appearance. The phenomena of general fever remain no longer latent or equivocal even to the most superficial observer, but openly assail the prostrated system with

to be nothing more than a translation of febrile action principally from the stomach to the skin; hence the obvious relief given to the former by the appearance of an eruption in the latter part of the system; and hence the re-attack made on the stomach if, in consequence of imprudent exposure to cold or moisture, the cuticular eruption prematurely disappear. Thus, in like manner, in the erysipelas of the face, the rose-like efflorescence is doubtless an unequivocal translation of fever from the vessels of the brain to those of the skin; hence the comatose symptoms, that seldom fail to characterize the earlier stages of this disease, are so uniformly relieved on the appearance of the efflorescence and swelling; and hence the re-attack so frequently made on the vessels of the brain when the cuticular affection too suddenly retires.

high degrees of violence. Respiration becomes uniformly and permanently more difficult and laborious ; but this difficulty is so much increased by occasional paroxysms, that the patient is in the utmost danger of death from actual suffocation.

At this period of the disease the countenance is sometimes pale, marked by frequent but transient flushings, and sometimes full and rather livid, in consequence of a partial stagnation of the blood. I have frequently seen the patient disposed to a comatose state, had not such quietude been prevented by the perpetual irritation of the membrane in the trachea, and by the necessary and increasing violence of respiratory efforts. In consequence of the uniform reiteration of such efforts, together perhaps with the small quantity of air taken into the lungs at each act of inspiration, the excitability of the system is gradually diminished, the voluntary powers are greatly exhausted, and every symptom of danger and distress is evidently augmented ; the business of respiration grows more and more difficult and laborious ; exertions of coughing are too arduous to be any longer effected ; the pulse becomes weak, oppressed, and trembling ; the eyes are suffused by a glairy pellicle ; the system is invaded by occasional convulsions, till, finally, after a painful struggle of actual strangulation the miserable patient expires.

SECT. IV.

OF DIARRHEA INFANTUM.

THIS disease, called by some writers Cholera infantum, is, as the name itself imports, principally confined to infants and children of an early age. From the termination of the first six months of life, to the close of the third year, children are most subject to be attacked by this painful and dangerous disorder. After the expiration of the fourth year its occurrence is by no means frequent. In children, however, of a weak constitution, and of a lax and irritable habit of body, this disease sometimes appears as late as the ninth or tenth year of life. In instances of the latter description its symptoms are less distressing, and its consequences much less dangerous, than when it attacks subjects of an earlier age. It never fails to prove troublesome, and is too often attended with absolute danger, when it assails children during the tedious and painful process of dentition.

Happily for the weak and tender part of the human race, diarrhea infantum is much more under the influence and controul of temporary and local circumstances, than either of the diseases just described. It is more limited as to the *season*, it is

more peculiarly restricted as to the *place* of its general occurrence. It prevails only during the summer and the earlier part of the autumnal season; and seldom appears save in the foul and heated atmosphere of a crowded city. The pure and breezy air of country situations, remote from marshes or other large bodies of stagnant water, so far from giving origin to this melancholy disease, affords the most efficacious remedy to such children as have already become the unhappy subjects of its violence.

Diarrhea infantum may be therefore considered as a genuine endemic of large and populous cities. Most infants and children of the age already mentioned, who pass the whole of the summer months in the city of Philadelphia, are subjected to more or less inconvenience and pain from the unwelcome visits of this troublesome disorder. During the months of July, August, and September it usurps the empire over all other infantile diseases, and reigns for the most part without a contending rival.

Diarrhea infantum may be defined, a disease consisting of frequent and copious discharges by stool, of a muco-bilious matter *, sometimes coloured by

* The stools of children affected by the disease now under consideration, possess, for the most part, more or less of a green admixtures

admixtures of blood, and always accompanied by a fever of excessive action. As in the diseases of hydrocephalus internus and cynanche trachealis, so here, likewise, I consider fever as the primary affection, and the bilious diarrhea as nothing else than a necessary result of febrile action unduly determined to the liver and intestinal canal.

Infants and children of every description of constitution and habit of body, are liable to be arrested by this troublesome and painful disorder. According, however, to the result of my observations on this subject, such as are considerably robust and fleshy are in more immediate danger of suffering from this scourge of early life. Such children as we would judge most strongly disposed to hydrocephalus internus or cynanche trachealis, during the winter and vernal months, are most frequently at-

ish tinge. This colour results, most probably, from a reciprocal action of acid and bile on each other. For besides the evident propensity of the hepatic system to generate, in this disease, a preternatural quantity of bile, we have evidence sufficient to induce us to believe, that the stomach is also strongly disposed to secrete, by its morbid action, a superabundant quantity of an animal acid. Of these two fluids a conflux and intimate mixture take place in the course of the small intestines, where by their joint chemical action on each other they bestow on the contents of these viscera the above greenish cast.

tacked by diarrhea infantum in the course of the summer, or about the commencement of the autumnal season.

The precursors or earliest symptoms of diarrhea infantum are very nearly the same with those that usher in the two diseases already described in the preceding sections. They are such as unequivocally announce the existence of fever. The child grows heavy, dull, inactive, and peevish; loses its keen relish for all the frolic amusements of its age, or becomes very soon fatigued and disgusted in their busy pursuit: fretfulness, loss of appetite, and occasional fits of nausea succeed. A diarrhea comes on, moderate indeed at first, but accompanied with gripings more or less severe, and with a considerable discharge of flatus from the intestines. The skin is for the most part rather parched and dry, except during temporary fits of nausea or perhaps of vomiting, when a plentiful moisture appears on the face, and sometimes on other parts of the body. Children of three or four years old complain frequently of pain in the head and back, or of troublesome shooting stitches in various other parts of the system.

All the febrile symptoms are *gradually*, sometimes more *rapidly*, augmented in violence. Thirst more
or

or less troublesome and distressing supervenes; the pulse becomes frequent, quick, and sometimes considerably full, tense, and hard. The diarrhea grows more profuse, the gripings more severe, and the stools are occasionally tinged with slight effusions of blood. This disease, like most other complaints of the summer and autumnal seasons, is marked with evident morning remissions and very considerable evening exacerbations. During the earlier hours of the night repose is much interrupted, sometimes entirely prevented, by the frequency of the calls to intestinal evacuations, together with the pain by which they seldom fail to be accompanied.

For a period of time extremely different in different cases, and which cannot therefore be specified with any degree of definitude, these symptoms continue to pursue their course, suffering little or no variations save such as result from the increasing debility of the patient. By degrees, however, a very striking change is at length effected; every symptom of danger grows more and more alarming; the child becomes much emaciated and extremely reduced in point of strength; the stools grow more frequent, watry, and offensive; sometimes an abundance of small worms are discharged; at other times the aliments taken in are evacuated without much visible alteration.

About this period of the disease superficial ulcerations of the lips, mouth, fauces, and about the termination of the intestinum rectum appear, and are probably continued throughout the whole tract of the alimentary canal; the eyes retire deep within their orbits; and the general shriveling and contraction of the countenance exhibit, for the most part, a very high degree of what is denominated *facies hippocratica*. As the bones themselves give now to the face its general configuration and appearance, unmodified by muscle or adipose substance, it is at this period of the disease that children are often said with propriety and truth to resemble some of their ancient relations.

Strength, both muscular and arterial, being greatly expended, locomotion is no longer practicable, and the action of the arteries is little more than barely perceptible; the whole volume of fluids being almost exhausted, the plenitude of intestinal evacuation can be no longer continued. The stools are therefore much less frequent and copious than before. I have seen children in this complaint but little troubled with diarrhea for several weeks immediately previous to their death. General debility, however, still continues to make gradual encroachments; and so extremely imperceptible are its advances, that the patient is often surrendered into the arms of death without the faintest struggle of resistance.

Thus

Thus insidious, in most cases, is the original attack ; thus flow the subsequent progress ; and thus gradual the final termination of diarrhea infantum. It is necessary, however, to observe, that its phenomena and movements do not at all times exactly correspond to the preceding description. It sometimes assumes a more daring appearance, and runs its course with swifter steps. After having, for a few hours, or perhaps not more than a few minutes, exhibited itself in the form of general fever, considerably violent in degree, it assumes on a sudden the more alarming appearance of *genuine cholera*. The natural contents of the stomach and intestines are first evacuated ; after which profuse discharges of bile, mucus, and perhaps acid, occur both by stool and vomit. Sicknefs the most distressing and deadly prevails ; an entire prostration of strength supervenes ; general convulsions often ensue ; and, unless supported by the most speedy and effectual aid, the patient soon falls a victim to the impetuosity of the disease.

SECT. V.

OF THE ORIGINAL SAMENESS* OF HYDROCEPHALUS INTERNUS, CYNANCHE TRACHEALIS, AND DIARRHEA INFANTUM.

ON this part of my subject, in particular, I wish to be clear, explicit, intelligible. I would not have my opinions on this important point of *pathological doctrine* in any degree misrepresented, in any degree misunderstood. The reader will therefore indulge me in an attempt to develop my precise meaning with all possible clearness and definitude, previously to bringing forward any thing in illustration and support of my opinions.

I do not contend that the local affections of hydrocephalus internus, cynanche trachealis, and diarrheæ infantum are, when completely established in

* To simplify the theory, and consequently the treatment, of diseases; to direct the attention of physicians to general principles, not to topical phenomena; and thus induce them to prescribe to *original causes* rather than to *subsequent symptoms*, are doubtless very important desiderata in the science and practice of medicine. An earnest wish to aid in the accomplishment of ends so favourable to science, so interesting to humanity, constituted indeed my principal motive for engaging in the present investigation. How far I may be successful in my attempt, can be ascertained only from the reception with
their

their respective organs, the same individual complaint. I well know that an aqueous or a serous effusion into the ventricles of the brain, is widely different from a mucoid effusion into the aspera arteria, and that a muco-bilious effusion from the liver and intestinal canal is a morbid phenomenon different from both. I only contend that these topical affections are nothing else than kindred *phenomena* or *effects* resulting from the operation of the same general cause. These three local diseases I consider as a truly fraternal offspring descended from *fever* as their common parent. This febrile action, when determined with disproportioned impetuosity to the vessels of the encephalon, begets hydrocephalus internus; when to those of the trachea, cynanche trachealis; and when to those of the intestinal and hepatic systems, diarrhea infantum. I will farther add, that when this same febrile impetuosity attacks the pleura or membrane lining the thorax and lungs, a peripneumonic affection is the painful but necessary result. For I consider the general affection from whence originate the three infantile complaints in immediate contemplation, as a *fever of excessive action*. This, when determined to any part with force sufficient to produce a topical inflammation,

which my opinions will meet, among the professors and practitioners of the healing art.

becomes

becomes a genuine *inflammatory fever* *. Thus, for example, if inflammation be excited in the volume of the encephalon, the disease is denominated *phrenitis* ; if in the liver, *hepatitis* ; and *rheumatism* when the inflammatory affection is thrown on the joints.

For the sake of more entire perspicuity, I shall here take the liberty of condensing into the *brevity*, and modelling into the *form*, of an aphorism, the general position which I would wish to establish relative to the present point of pathology.

The three topical complaints of hydrocephalus internus, cynanche trachealis, and diarrhea infantum, may be considered as equally the result of a general

* I have already suggested my opinion of the propriety of distinguishing between a simple fever of excessive action, and that more complex state of disease, with justice entitled to the denomination of a truly *inflammatory fever*. At present I would beg leave further to observe, that fevers of excessive action may in many respects deviate from their simplest form, without justly acquiring the name of *inflammatory*. Thus, for example, a fever of too much action may be accompanied with an undue determination to, and a considerable pain in, the *head*, while at the same time no inflammatory affection exists either in that or in any other part of the system. A similar observation may be made relative to the three infantile diseases of which I at present treat. In neither of these can the original fever be said to assume and preserve the simplest form ; and
febrile

febrile affection; and the same precise species of fever, namely, a fever of excessive action, appears to give origin to the whole. The truth of this interesting and important point of pathological doctrine, I would endeavour to establish by the following series of propositions.

I. That the diseases in question are indeed originally of a *general*, and not of a *local* nature, we would presume to infer from two considerations the most obvious and direct; namely, that the causes, from which they originate, are *general*, and most probably therefore productive of a *general*, not a *partial* result: and that these causes operate always on the living system *at large*, not *exclusively* on any *particular part*. Reasoning *a priori*, therefore, we must necessarily infer, that the system at large is originally affected.

II. In all cases of these complaints that have ever fallen under my observation, the topical affections were preceded by the existence of *general fever*, with as much uniformity as an effect can, in any instance, be preceded by its immediate cause. This febrile affection was evidenced by symptoms so direct

yet in very few cases do we discover the existence of actual inflammation.

and

and unequivocal as, with every unprejudiced mind, to establish the truth of its pre-existence beyond the faintest shadow of a doubt. In no case to which I have ever attended did either of the local effusions first occur, giving birth to general fever of a subsequent date. Nor indeed do these effusions strike me as causes either adapted in their *nature*, or perhaps I may say, adequate in their *magnitude*, to give origin to the degrees of fever by which they are generally accompanied. As, therefore, *general fever* is an uniform concomitant in each of these three complaints—as it never fails to *precede* the existence of topical effusion—as its violence is always more or less reduced by the occurrence of such effusion—but more especially, as a timely and complete reduction of fever will (as shall be shown hereafter) effectually prevent effusion from taking place, we are certainly authorised by the most chaste and correct principles of analogy to conclude, that in such cases fever is indeed the original cause, and effusion nothing more than the subsequent effect.

III. The *sameness* of the febrile affection from which hydrocephalus internus, cynanche trachealis, and diarrhea infantum derive their existence, we would infer from the following consideration. These diseases are more especially confined to infants and children similar in age, similar in constitution, and
considerably

considerably alike in all their general habits. Hydrocephalus internus and cynanche trachealis occur in the same seasons, in the same situations, and appear to be brought on by the operation of the same remote and exciting causes. This latter observation does not so directly embrace diarrhea infantum, that disease occurring only in the summer season—a season which by means of atmospheric warmth, of impure air, of some peculiar gas *, or probably by the joint co-operation of these three agents, produces indeed a very striking, and perhaps I may add, specific effect on the intestinal and hepatic systems.

IV. These complaints are known not very unfrequently to suffer a reciprocal alternation with each other. Thus, what practitioner of experience and observation has not seen sometimes hydrocephalus

* From a series of late experiments it appears, that *inflammable air*, (denominated by the French chemists *hydrogenous gas*) possesses qualities capable of producing a specific determination to the hepatic system. Does not such a discovery give us reason to suspect, that a superabundance of this *subtle gas*, with which the summer atmosphere of large and populous cities may be impregnated, acts, at least, as an auxiliary cause, in giving birth to diarrhea infantum? And might not a course of well conducted experiments on this subject, lead on to future discoveries, equally favourable to the interest of humanity, and to the farther advancement of medical science?

lus internus, and sometimes cynanche trachealis, produced by imprudently checking the intestinal discharge in diarrhea infantum previously to the necessary reduction of the existing fever? As instances of such *mutation* or rather *translation* of disease must doubtless have occurred to other physicians as well as to myself, I rely for support, at present, on their own recollection and candor, and forbear to trouble my reader with the disagreeable prolixity of minute details. In a case lately under my direction, the patient (a child nearly three years old) was first affected with evident symptoms of approaching hydrocephalus internus. These were, by early and proper attention, all subdued in the space of about three days. Four days afterwards febrile symptoms again returned; cough and difficulty of breathing occurred; true cynanche trachealis supervened; and notwithstanding every opposing effort I could possibly make, my patient fell a speedy victim to the uncommon violence of the disease.

V. The *morbid processes* by which these local diseases are immediately effected are doubtless of a nature truly *evacuant*—All evacuations evidently produce on the system effects unequivocally *sedative*; but all sedatives certainly operate to the *prevention* or *removal*, and never to the production of general fever. We may therefore safely conclude on such principles

principles as these, that the local diseases, in immediate contemplation, cannot possibly act as the cause of that febrile affection by which they are uniformly accompanied.

VI. No instance I believe can be given in which a morbid and preternatural discharge of any fluid from small vessels of the system, is of long and dangerous duration, unless such discharge be kept up by the impetus of the blood subjected to a certain degree of febrile action *. Thus, for example, hemorrhages from the nostrils, unless generated and nourished by pre-existing fever, are generally so slight and transient as seldom to become objects of medical attention. The same observation may also be made, relative to occasional attacks of hæmoptysis brought on solely by violent exertions of coughing. In like manner, the catamenial discharge in females is generally regulated, both as to its quantity and duration, by the degree and continuance of concomitant fever. When the febrile affection is slight, the evacuation is proportionally moderate; but when the

* Although it be true that hæmorrhages are by surgical writers divided into *active* and *passive*, yet I must confess, I have very seldom, if ever, seen a case of hæmorrhagy truly passive, in which either the excess or obstinacy of the evacuation was such as to call for any high degree of medical attention.

former is considerable, the latter is, for the most part, profuse and troublesome. Now as the morbid evacuations immediately in question, particularly those of hydrocephalus internus and diarrhea infantum, are both considerable in quantity, and obstinate in continuance, we may by accurate analogy with the preceding positions conclude, that they originally result *from*, and are subsequently kept up *by*, an *excess* of action in the arterial system.

VII. The last argument I shall attempt to advance in favour of the original sameness of hydrocephalus internus, cynanche trachealis, and diarrhea infantum, is derived from the most successful method of treating these three truly dangerous and melancholy diseases. I must here beg leave to observe, that when exhibited at a period sufficiently early, the same individual remedies are found to prove equally efficacious in each. In a former part of this dissertation, it has, I flatter myself, been in some measure established, that the three topical diseases of which I treat, make their first appearance in the system under the form of a general fever of excessive action. It has been also just observed, that this fever may, in all cases, be moderated and reduced by precisely the same mode of medical treatment. Have we not then sufficient testimony to warrant us in concluding, that in their original and febrile state, these
melancholy

melancholy diseases are unequivocally the same? But a brief detail of the most successful method of cure shall constitute the subject of my concluding section.

SECT. VI.

OF THE TREATMENT OF HYDROCEPHALUS INTERNUS, CYNANCHE TRACHEALIS, AND DIARRHEA INFANTUM.

I HAVE finally arrived at the most important, and therefore the most interesting part of the present dissertation—that part which *alone* relates *immediately* to the practice of the healing art—that part which alone is directly applicable to the alleviation of human misery. How extremely happy would I account, how peculiarly fortunate would I consider myself, could I with equal propriety add, that part on which I am able to speak with the fullest confidence in the truth of my principles and opinions! But a melancholy want of success in several cases, where at first my prospects were the most fair and flattering, and consequently my expectations sufficiently sanguine, has furnished me with a degree of professional humility, and taught me, at least, to doubt respecting the final result of medical remedies.

I have already intimated that it is not my intention to speak, under the present head, of the cure of the three preceding diseases after the topical effusions have actually taken place. My observations shall be confined entirely to their prophylaxis or prevention. This desirable end can be accomplished only by paying early and due attention to the pre-existing fever from which alone these topical affections derive their existence.

I have in a former part of my dissertation observed, that I consider the three diseases in question as resulting from an entire *unity* of fever, namely, a fever of excessive action. Effectually to reduce this febrile affection, and by that means prevent the serious and fatal consequences that might otherwise ensue, should constitute the sole object of the physician when called in at an early period of disease. Thus, for example, if called to a child recently attacked by a fever of excessive action, accompanied with violent pain in the head, with cough and difficult respiration, or with frequent and copious evacuations of bile from the intestinal canal, although I might be led to apprehend the approach of hydrocephalus internus in the first case, that of cynanche trachealis in the second, and that of diarrhea infantum in the third, yet my whole attention, instead of being directed to the possible occurrence of either of these

topical

topical affections, at a future period, would be confined entirely to the state of general fever already existing. Instead of resting satisfied with topical remedies directed only to the head, throat, or alimentary canal, my attention would doubtless extend to the condition of the system at large. All my views would be instantly pointed, and every possible effort would be immediately directed, to the complete reduction of the *existing fever*; from an entire conviction, that by the accomplishment of this end, all its present symptoms would certainly disappear, and all its troublesome consequences be effectually prevented.

As uniform experience has long since directed legislators to the propriety of attempting the prevention of approaching evils by means of salutary and wise institutions, rather than of hazarding the disagreeable and perilous alternative of eradicating vices already existing, by laws of a sanguinary spirit, a similar maxim of prudence ought doubtless to be adopted by practitioners of medicine. They should ever bear in mind that it is not only a matter of more ease to themselves, but also of more comfort and safety to their patients, always, if practicable, to prevent diseases of every description from becoming fully established, rather than to risque the experiment of removing them from the system after

they have acquired a confirmed existence. This is more particularly the case with regard to the topical diseases embraced in the present dissertation. If treated with sufficient boldness and propriety at an early period, daily observation bears testimony that they may be very generally prevented ; whereas, on the other hand, if suffered fully to form and thus gain unmolested possession of their respective situations, it is indeed a truth equally humiliating to the baffled practitioner, and alarming to the afflicted patient, that they too frequently bid a safe defiance to every possible expedient and effort of the healing art.

From repeated experience and observation I am finally persuaded, that this pre-existing state of fever, (which should be considered as the threshold to the local diseases immediately in question), may, in general, be most speedily and certainly subdued, by attentively pursuing the two following *principles*, or general *indications* of cure.

First. By securing the body, as far as possible, from the access and operation of all *external* and *adventitious* stimuli.

Secondly. By diminishing, to a certain extent, the quantity and impression of those *internal* and
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more *essential* stimuli,* to the action of which the system is always subjected.

The first of these general indications is to be answered only, by pursuing, to a proper length, what medical writers have denominated the *antiphlogistic regimen*. The temperature of the chamber must be equable and moderate, not exceeding the sixtieth degree on the scale of Fahrenheit; and the atmosphere of the sick-room must be frequently changed—perfect rest should be enjoined—light should be, in a great measure, excluded—conversation and noise should be strictly prohibited—the mind should be zealously guarded against passions and emotions of every kind; for in all cases of violent febrile affection, it is indeed an important desideratum that the patient's mind should be suffered to remain in a state of the most unruffled tranquillity*: All food

* Much has been said by medical writers respecting the salutary effects of *fear* and other debilitating passions of the mind in cases of *general fever*. That such mental affections might be rendered useful in the treatment of febrile diseases, I was taught to believe as one of the essential articles of my medical creed. Were I to rest satisfied with speculation alone on this subject, I would still subscribe to the plausibility of the same opinion; for it is doubtless a favourite child of hypothesis. But as it is highly unphilosophical to admit, as decisively certain, any medical tenet which we have not seen sanc-

of a highly stimulating nature, even if called for, should be carefully withheld—aqueous and subacid liquids may be used in considerable quantities; but both drink and aliment should be administered cold rather than warm. By a steady and uniform adherence to such directions as these, the fever may be, if not moderated, at least prevented, in most instances, from acquiring any additional violence.

The second indication of cure shall be now made the subject of a few general observations. This can be fully and satisfactorily answered in no other way than by a free and judicious use of that class of remedies denominated *sedatives*.

I. Of this class the first, and by far the most powerful is the evacuation of *blood-letting*. Of this re-

tioned by the test of experiment, this position respecting the utility of such affections of the mind, in the cure of fevers, must as yet remain, with me, a problematical point. Were physicians, however, more intimately acquainted with the *nature*, but, particularly, had they at command a complete *regulation*, of the human passions, they would then be certainly able to render them in some measure subservient to the alleviation and removal of general disease. In particular cases of dropy and of what may be denominated *sthenic insanity*, fear and terror have been known frequently to produce effects the most striking and salutary.

medy the *repetition* and *extent* must be submitted entirely to the discretion of the practitioner—*They* can be duly defined and regulated only by the existing circumstances of each particular case. It may not be improper however to observe, that I have always, in febrile affections, derived the most unequivocal and striking advantage from this evacuation, by having it performed near to the commencement of their evening exacerbations.

II. The next remedy to be mentioned is that of *purgatives*. Too much attention cannot possibly be paid to evacuations by stool, particularly in those cases of fever in children, where there exist evident symptoms of an undue determination to the head or aspera arteria. In such instances purgatives of considerable activity are found to be greatly superior to those that are more lenient and mild.

III. SUDORIFICS. If a free, copious, and general *perspiration* can be brought on by the use of antimonials or other remedies that do not rouse the system to an increase of febrile action, it seldom fails to be productive of a salutary effect.

IV. DIURETICS. Respecting this class of remedies I have indeed but very little to advance: I think

think however that I have sometimes seen an increased flow of urine excited, and thus a partial reduction of fever effected, by means of *squills*, as well as by certain combinations of *digitalis* and *nitre*.

V. SIALOGOGUES. I have certainly, in a variety of instances, seen truly alarming affections of the head, together with considerable degrees of concomitant fever, greatly alleviated by means of a slight mercurial ptyalism. In most cases therefore of impending hydrocephalus internus, more especially where recourse has been had in vain to other evacuations, I would judge it expedient and proper to exhibit mercury in such quantity and under such form, as may be best calculated to produce a speedy discharge from the salivary glands.

VI. The last sedative *evacuant* I shall here recommend is that of *cold*, applied directly to the head, and occasionally to other parts of the body. Let not such orthodox physicians as are accustomed to view objects only through the medium of an established system, be startled at my novelty in classing cold among those remedies denominated evacuants. As a real evacuant I consider, as a real evacuant I use, this remedy in my practice as a physician, and as a real evacuant I trust it will appear to every unprejudiced

prejudiced mind, from a view of the following succinct explication.

Heat is a fluid known to be as natural, as essential to the living system of man, as the chyle that moves in the lacteals, or the blood that circulates through the arteries and veins. During the existence of general fever a morbid accumulation of heat supervenes : The elimination of the superabundance of this fluid from the system must be effected by a process equally evacuant with that which conveys off a portion of the blood. But this process can be in no other way *directly* accomplished than by subjecting the system to the immediate influence and action of cold. Here then the remedy of cold operates as the efficient cause of a literal evacuation ; and hence may be considered as the real and specific *evacuant* of heat.

Should any topical pain or uneasiness still exist, even after the fever has been thus reduced by a due perseverance in the general indications of cure, local remedies, such as cupping, blistering, &c. should be immediately applied.

I have thus in a very brief, general, and I am sorry to add, superficial manner, delivered the result
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of my experience and observation relative to the history, the nature, and the early treatment of certain diseases peculiar to infants and children.

But to close my dissertation without paying a tribute of general acknowledgment to the *medical professors* of that institution, under the auspices of which I have pursued my studies with equal pleasure and advantage, and from the authority of which I am now about to derive the highest honours of my profession, would indeed be an act of high injustice to my own feelings, and of criminal ingratitude to those, who have been long my public patrons, and long my private friends.

To you, gentlemen, my *obligations* are numerous ; to you my best *acknowledgments* are due—Accept the *latter* ; the *former* no acts of mine can ever cancel, no possible combination of circumstances can ever wholly annul : Deep in my memory are your offices of *politeness* and *attention* imprinted, never to be effaced by reverse of fortune or by lapse of time.

I trust, gentlemen, that my future conduct as a fellow-citizen, as a fellow-practitioner, and as a fellow-member of various literary institutions, shall ever

furnish the most ample and indubitable testimony of the sincerity and truth of what I now declare.

Impressed with the most cordial wishes for a long continuance of your utility and fame in *public*, and of your individual respectability and happiness in *private* life, I now bid you, as your pupil, a lasting and an affectionate adieu.

THE END.

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